

CLAIMS

What is claimed is:

1. A method for assigning timeslots for a particular cell of a hybrid time division multiple access/code division multiple access communication system, the system having a plurality of cells comprising the particular cell and other cells, the method comprising:

determining potentially interfering ones of the other cells which potentially interfere with the particular cell;

for each timeslot, eliminate that timeslot for uplink communication, if first ones of the potentially interfering ones uses that timeslot for downlink communications;

for each timeslot, eliminate that timeslot for downlink communication, if second ones of the potentially interfering ones uses that timeslot for uplink communications;

assigning a timeslot to an uplink communication of the particular cell using non-uplink elimination timeslots; and

assigning a timeslot to a downlink communication of the particular cell using non-downlink eliminated timeslots.

2. The method of claim 1 wherein the first ones are base station to base station interfering cells to the particular cell.

3. The method of claim 2 wherein the base station to base station interfering cells are determined by using link gains between base stations.

4. The method of claim 1 wherein the first ones and the second ones are base station to base station interfering cells to the particular cell.

5. The method of claim 1 wherein the second ones are user equipment to user equipment interfering cells to the particular cell.

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6. The method of claim 5 wherein the user equipment to user equipment interfering cells are geographically nearby cells to the particular cell.

7. The method of claim 6 wherein the geographically nearby cells are adjacent cells.

8. The method of claim 1 wherein the first and second ones are user equipment to user equipment interfering cells to the particular cell.

9. The method of claim 1 wherein the hybrid time division multiple access/code division multiple access communication system is a time division duplex communication system using code division multiple access.

10. A hybrid time division multiple access/code division multiple access communication system comprising:

a plurality of cells including a particular cell and other cells;

the particular cell comprising:

means for determining potentially interfering ones of the other cells which potentially interfere with the particular cell;

means for each timeslot, for eliminating that timeslot for uplink communication, if first ones of the potentially interfering ones uses that timeslot for downlink communications;

means for assigning a timeslot to an uplink communication using non-uplink eliminated timeslots; and

means for assigning a timeslot to a downlink communication using non-downlink eliminated timeslots.

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11. The system of claim 10 wherein the first ones are base station to base station interfering cells to the particular cell.

12. The system of claim 11 wherein the base station to base station interfering cells are determined by using link gains between base stations.

13. The system of claim 10 wherein the first ones and the second ones are base station to base station interfering cells to the particular cell.

14. The system of claim 10 wherein the second ones are user equipment to user equipment interfering cells to the particular cell.

15. The system of claim 14 wherein the user equipment to user equipment interfering cells are geographically nearby cells to the particular cell.

16. The system of claim 15 wherein the geographically nearby cells are adjacent cells.

17. The system of claim 10 wherein the first and second ones are user equipment to user equipment interfering cells to the particular cell.

18. The system of claim 10 wherein the hybrid time division multiple access/code division multiple access communication system is a time division duplex communication system using code division multiple access.

19. A hybrid time division multiple access/code division multiple access communication system comprising:

a plurality of cells including a particular cell and other cells;

a radio network controller associated with the particular cell comprising:

a resource allocation device for determining potentially interfering ones of the other cells which potentially interfere with the particular cell; for each timeslot, eliminating that timeslot for uplink communication, if first ones of the potentially interfering ones uses that timeslot for downlink communications; and for each timeslot, for eliminating that timeslot for downlink communication, if second ones of the potentially interfering ones uses that timeslot for uplink communication; and

a node-B associated with the particular cell comprising an assignment and release device for assigning an uplink communication using non-uplink eliminated timeslots and for assigning a downlink communication, using non-downlink eliminated timeslots.

20. The system of claim 19 wherein the first ones are base station to base station interfering cells to the particular cell.

21. The system of claim 20 wherein the base station to base station interfering cells are determined by using link gains between base stations.

22. The system of claim 19 wherein the first ones and the second ones are base station to base station interfering cells to the particular cell.

23. The system of claim 19 wherein the second ones are user equipment to user equipment interfering cells to the particular cell.

24. The system of claim 23 wherein the user equipment to user equipment interfering cells are geographically nearby cells to the particular cell.

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25. The system of claim 24 wherein the geographically nearby cells are adjacent cells.

26. The system of claim 19 wherein the first and second ones are user equipment to user equipment interfering cells to the particular cell.

27. The system of claim 19 wherein the hybrid time division multiple access/code division multiple access communication system is a time division duplex communication system using code division multiple access.

28. A method for assigning timeslots in a particular cell of a hybrid time division multiple access/code division multiple access communication system, the particular cell comprising a base station and a plurality of user equipments, the method comprising:

- (a) estimating timeslots having an unacceptable interference for uplink communications with respect to the base station;
- (b) estimating timeslots having an unacceptable interference for downlink communication with respect to the user equipments;
- (c) producing an availability list indicating available uplink and downlink timeslots having acceptable interference levels; and
- (d) assigning uplink and downlink timeslots using the availability list.

29. The method of claim 28 wherein the step (a) comprises measuring an interference level in each timeslot at the base station and comparing the measured level to a threshold to estimate unacceptable interference.

30. The method of claim 28 wherein the step (a) comprises determining base station to base station (BS-BS) cross interfering cells with respect to the particular cell and

estimating the unacceptable interference if any of the determined BS-BS interfering cells uses a timeslot for the downlink.

31. The method of claim 28 wherein the step (b) comprises measuring an interference level in each timeslot by each user equipment and comparing the measured levels to a threshold to estimate unacceptable interference.

32. The method of claim 28 wherein the step (b) comprises determining user equipment to user equipment (UE-UE) cross interfering cells with respect to the particular cell and estimating the unacceptable interference in a particular timeslot if any of the determined UE-UE interfering cells uses the particular timeslot for the uplink.

33. A hybrid time division multiple access/code division multiple access communication system comprising:

a particular cell comprising:

a base station and a plurality of user equipments;

first means for estimating timeslots having an unacceptable interference with respect to the base station;

second means for estimating timeslots having an unacceptable interference for downlink communication with respect to the user equipments;

third means for producing an availability list indicating available uplink and downlink timeslots having acceptable interference levels; and

fourth means for assigning uplink and downlink timeslots using the availability list.

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34. The system of claim 33 wherein the first means measures an interference level in each timeslot at the base station and compares the measured level to a threshold to estimate unacceptable interference.

35. The system of claim 33 wherein the first means determines base station to base station (BS-BS) cross interfering cells with respect to the particular cell and estimates the unacceptable interference if any of the determined BS-BS interfering cells uses a timeslot for the downlink.

36. The system of claim 33 wherein the second means measures an interference level in each timeslot by each user equipment and comparing the measured levels to a threshold to estimate unacceptable interference.

37. The system of claim 33 wherein the second means determines user equipment to user equipment (UE-UE) cross interfering cells with respect to the particular cell and estimating the acceptable interference in a particular timeslot if any of the determined UE-UE interfering cells uses the particular timeslot for the uplink.

38. A hybrid time division multiple access/code division multiple access communication system comprising:

a particular cell comprising:

a base station and a plurality of user equipments;

a node-B comprising a timeslot assignment and release device for assigning uplink and downlink timeslots using an availability list; and

a radio network controller comprising a resource allocation device for estimating timeslots having an unacceptable interference with respect to the base station, for estimating timeslots having an unacceptable interference for downlink communications with respect

to the user equipments, and for producing the availability list indicating available uplink and downlink timeslots having acceptable interference levels.

39. The system of claim 38 further comprising a memory associated with the resource allocation device for storing the availability list.

40. The system of claim 38 wherein the node-B further comprises a timeslot controller for updating at least a portion of the availability list and a memory for storing the at least a portion.

41. The system of claim 40 wherein the at least a portion is an entire version of the availability list.

42. The system of claim 40 wherein in the at least a portion is only information from the availability list pertaining to the particular cell.

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